XERISCAPING SAVES WATER - BUT DOES IT SAVE MONEY?

Gary L. Wade[1] and E. Neal Weatherly, Jr.[2]

AUTHORS: [1]Associate Professor, Extension Horticulture Department and [2]Head, Extension Landscape Architecture Department, The University of Georgia, Athens, Georgia 30602.
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INTRODUCTION

Xeriscaping, pronounced "Zera-scaping", is a term coined in Colorado in 1981 to define the process of making a landscape more water-efficient, not only in the design phase, but also through proper installation and water-wise management practices that conserve water. The concept involves seven principles which are collectively called xeriscaping: 1. Proper planning and design; 2. Practical turf areas; 3. Efficient irrigation; 4. Soil improvements; 5. Mulching; 6. Appropriate plant selection; and 7. Maintenance to reduce water needs (Wade et al., 1988). All are equally important in improving overall landscape water-use efficiency and water conservation.

The merits of the xeriscaping principles in water conservation are reiterated again and again in numerous publications and books on the subject, leaving the reader with little doubt that xeriscaping will save water. However, in addition to the well-documented environmental and aesthetic benefits of xeriscaping, consumers often ask about the economic benefits of xeriscaping. Does xeriscaping save enough money to warrant a substantial capital outlay to retrofit an existing landscape? If consumers can be shown economic benefits from xeriscaping, they will be more likely to implement changes in their present landscape.

In this study, a landscape retrofit model and computer cost estimator program were utilized to project costs and potential economic return on investment from xeriscaping.

METHODS

A hypothetical design depicting a typical before and after residential xeriscape retrofit was developed (Figure 1). To compare consumptive water use before and after the retrofit, average water and wastewater rates were computed using data from nine cities in metro Atlanta (Tables 1, 2.). Water-use zones assigned to the landscape (Fig. 1) were then used to estimate the annual water use and projected water and sewage costs before and after retrofit as shown in Table 3.

Assumptions were made as to the projected irrigation requirements of plants in each of the water-use zones, following a two-month establishment period during which the plants were watered regularly. The amount of water applied was based on Georgia Cooperative Extension Service recommendations to water thoroughly when needed to a depth of 6 to 8 inches with approximately 1-inch of water (600 gallons per 1,000 square feet) (Landry, 1986). Therefore, it was assumed that plants in the high water-use zones would receive 1-inch of supplemental irrigation water (600 gallons per 1,000 sq. ft.) an average of three times per month from April to October, and 1-inch of water per month from November to March. Those in the moderate water-use zones, on the other hand, would receive 1-inch of irrigation water once a month from April to October, and no supplemental irrigation from November to March. Plants in the low water-use zones of the landscape would receive no supplemental irrigation at any time during the year.

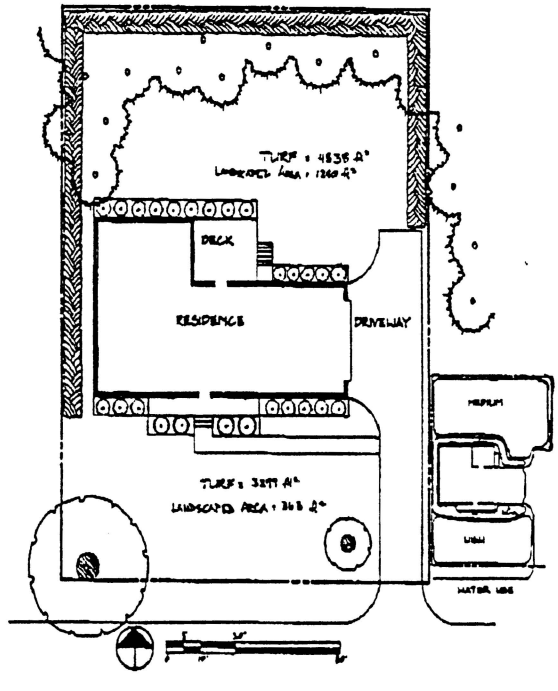

Figure 1a. Before Xeriscape Retrofit

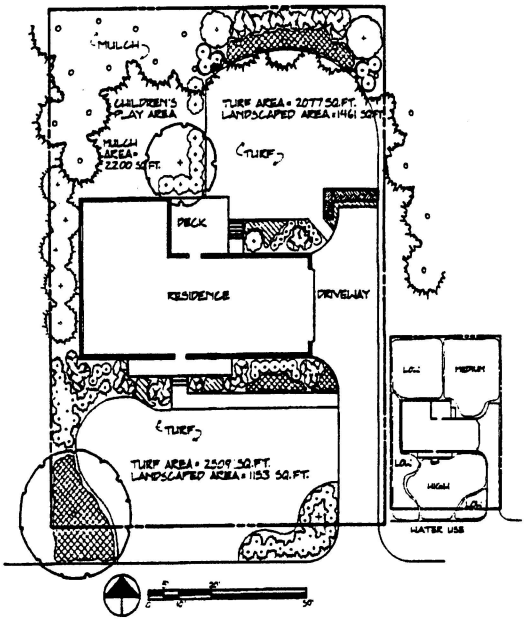

Figure 1b. After Xeriscape Retrofit

TABLE 1. Average Water Rates of Nine Metro Atlanta Cities, May, 1990

City	Min. cost/2,000 gal [1]	Added cost per 1,000 gal.
Austell	$3.50	$1.75
Dacula	$8.25	$3.38
Duluth	$7.00	$3.30
Fairburn	$7.00	$1.50
Forest Park	$6.00	$1.95
Lawrenceville	$4.84	$2.17
Locust Grove	$7.00	$2.50
Palmetto	$8.25	$3.25
Powder Springs	$6.89	$1.89
Ave.	$6.53	$2.41

[1]Cost represents either residential cost or outside city cost. Atlanta Regional Commission Survey, 1990.

TABLE 2. Average Wastewater Rates of Eight Metro Atlanta Cities, May, 1990

City	Min. cost/2,000 gal.[1]	Added cost per 1,000 gal.
Austell	$4.34	$2.17
Fairburn	$7.00	$1.50
Forest Park	$6.00	$1.95
Locust Grove	$3.00	$0.66
Marietta	$4.90	$2.45
McDonough	$6.50	$1.75
Palmetto	$4.50	$2.75
Powder Springs	$4.14	$2.07
Ave	$5.04	$1.69

1 Cost represents either residential cost or outside city cost, Atlanta Regional Commission Survery, 1990.

A computerized cost estimator for estimating landscape maintenance costs was utilized to project direct costs of maintaining the landscape before and after the xeriscape retrofit (Thomas et al., 1990). Management schedules, areas serviced and estimated direct costs before and after retrofit are shown in Tables 3, 4 and 5.

Installation costs of the landscape retrofit were estimated using average unit retail prices of plants and materials (Table 6). It was assumed in this model that the landscape would be installed by the resident who would not allocate his time as a direct job cost.

Utilizing this model and data generated, consumptive water use, water cost, and maintenance costs before and after retrofit could be compared and used to forecast savings and return on investment from xeriscaping.

TABLE 3. Surface Area, Estimated Annual Water Use, Projected Annual Water Cost, and Annual Sewage Costs by Water Use Zone Before and After Xeriscape Retrofit.

	Square feet		Annual water use [1] (gallons)			Projected Annual Water Cost			Projected Annual Sewage Cost		
Zone	Before	After	Before	After	Change	Before	After	Change	Before	After	Change
Low	0	3353	0	0							
Mod.	5788	3538	24310	14860	-9450	$60.29	$37.52	-$22.77	$42.74	$26.77	-$15.97
High	3662	2509	57127	39140	-17987	$139.39	$96.04	-$43.35	$98.20	$67.81	-$30.39
Total	9450	6047	81437	51723	-27437	$199.68	$133.56	-$66.12	$140.94	$94.54	-$46.36

[1]Assumptions: High water-use zone receives 1-inch of water (600 gal./1000 sq. ft.) 3 times/month from April to Oct. and 1-inch of water/month from Nov. to March; Moderate water-use zone receives 1-inch of water/month from April to Oct., and no supplemental water from Nov. to March; low water use zone receives no supplemental water after establishment.

TABLE 4. Landscape Management Schedule- Services and Estimated Frequencies by Area Before and After Xeriscape Retrofit.

Task	Frequency/yr. Before	After
Turf		
Mow	32	20
Fertilize	2	1
Chem. Weed Control	2	1
Pest Control	2	1
Weed Eat	16	10
Aerate	1	1
Landscape		
Weed Control	2	2
Fertilize	2	1
Pest Control	2	2
Prune	3	1
Mulch	1	1
Flower Beds		
Prepare/plant	0	1
Mulch	0	1
Hand Weed	0	2
Fertilize	0	1
Pest Control	0	2
Groom	0	4

TABLE 5. Areas Serviced and Estimated Annual Maintenance Costs of Xeriscape Retrofit.

	Square feet		
Areas Serviced	Before	After	Change
Turf	7837	4516	-3321
Ornamentals	1613	2614	+1001
Totals	9450	7130	-2320
	Estimated Costs[1]		
Direct Costs			
Equipment	$52	$23	-$29
Labor	$530	$335	-$195
Materials	$78	$167	+$89
Totals	$660	$525	-$135

[1] Costs derived via Hort Management, Computer Cost Estimator for Landscape Managers, ver. 3.0, The University of Georgia Cooperative Extension Service Special Publication no. 1., Nov., 1990. Assumption: Labor wage of $10/hr

DISCUSSION

By re-zoning the model landscape when converting from the traditional to the xeriscape landscape, total irrigated area was reduced by 3403 square feet while consumptive water use over a twelve-month period was reduced by 27,437 gallons, providing an annual savings of $66.12 on the water bill and $46.36 on sewage, based on May, 1990 data from the Atlanta Regional Commission (Tables 1, 2 and 3).

During the xeriscape retrofit, the turf area was reduced by 3321 square feet, while the area devoted to ornamental plants was increased by 1001 square feet (Table 5.). A considerable amount of the landscaped area, 2200 square feet, was converted to pine straw mulch. By re-zoning the landscape and changing its watering schedule, maintenance requirements could also be adjusted as shown in Table 4. Less supplemental irrigation, combined with less frequent fertilization and conservative pruning, resulted in a substantial reduction in the maintenance requirements of the xeriscape model. These savings equated to an annual direct cost savings of $135 as shown in Table 5. Therefore, total annual savings shown by this retrofit model is $247.48 ($135 (maintenance) + $66.12 (water) + $46.36 (sewage)).

Finally, estimated installation costs, excluding labor, were used to forecast a time interval for complete return on investment (Table 6). Assuming a 10% inflation in annual water and sewage rates and maintenance costs, the model shows a potential return on investment in as little as 3 years, 11 months (Table 7). A comparable bank return on a $1221 investment at 8% interest would require approximately nine years.

Since Xeriscaping is as much a behavioral concept as it is a physical concept, the authors do not wish to imply that physical changes to the landscape are necessary to save water and money. Considerable savings can be realized by simply recognizing when to water, how to water, the most efficient methods for applying water and the different water requirements of plants in the landscape, and then modifying watering practices accordingly.

TABLE 6. Estimated Plant and Material Costs for Model Xeriscape Retrofit.

Item	Quantity	Unit Cost	Total Cost
1 gal. plt.	47	$4.00	$188
3 gal. plt.	37	$8.00	$297
5 gal. plt.	9	$14.00	$126
Grnd Cover	430	$0.80	$344
Annuals	300	$0.30	$90
Mulch	44	$4.00	$176
		Total:	$1221

TABLE 7. Projected Time for Return on Investment on Model Xeriscape Retrofit

	Savings/yr.[1]	Cost
Installation		$1221.00
Year 1	$272.23	$948.77
Year 2	$299.45	$649.32
Year 3	$329.40	$319.92
3 yrs., 11 mos.	$362.34	$0.00

[1]Assumption: 10% increase in water rates and maintenance costs per year.

SUMMARY

Under the parameters of this study, the process of retrofitting an existing landscape to make it more water-efficient has been shown to provide considerable economic benefits. Landscape architects and landscape contractors are encouraged to use similar models to show their clients the economic benefits of xeriscaping. Most clients today want low-maintenance, environmentally sound landscapes, and xeriscaping fits this need. However, a successful marketing program for xeriscaping should promote not only the environmental and aesthetic benefits of the concept, but also the economic benefits, including appreciated property value and enhanced resale potential.

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